Omnitron Systems Technology, Inc.

***iConverter*® GX/F User Manual**

Port 1 (P1), Gigabit 1000X

Port 2 (P2), Fast Ethernet 100FX

ABOUT THIS MANUAL

This document supports revision "xx/10" of the GX/F. Please refer to the serial number label on the GX/F for the revision number of your product. This revision incorporates the following improvements to the GX/F:

1. Product enhancements now prevent unpredictable behavior under undefined or incompatible DIP-Switch selections.

2. LINK MODES have been increased to include RFD+LS and RFD+LP modes. Improvements to LED behavior have been made to accommodate these new link modes.

OVERVIEW

The ***iConverter*** GX/F media converter provides Gigabit 1000X fiber to Fast Ethernet 100FX fiber conversion. It is a member of the modular ***iConverter*** product family and supports multimode, single-mode and single-fiber options. The ***iConverter*** GX/F repeats, regenerates and re-times the fiber optic signal, and multiple GX/F repeaters can be cascaded to extend total network distances.

Using its switch-based architecture, the GX/F can be used as a two-port fiber converter, or using its two additional 10/100 Ethernet backplane ports, it can connect to adjacent modules and accommodate In-Band management or multi-module configurations (the different ***iConverter*** Chassis models provide backplane links to connect between adjacent modules).

The GX/F can be used in an unmanaged or managed fashion. When unmanaged, it can be installed in a chassis without a management module. To be managed, a Network Management Module (NMM) or an ***iConverter*** module with built-in management (such as a 10/100M or GX/TM) must be installed in the same chassis.

Advanced Features

The GX/F features Port VLAN and Tag VLAN, which allow control of traffic flow between both the fiber ports and the backplane ports. It also features Port Access Control, which facilitates enabling and disabling of individual ports.

The GX/F supports reporting of MIB statistics. Statistics are available for 32 variables per port, reporting a wide range of real-time packet statistics to provide performance and operational monitoring.

*NOTE: Using the advanced features listed above requires management via an NMM, or an **iConverter** module with built-in management (such as a 10/100M or a GX/TM) and **NetOutlook**™ Management Software, a third-party SNMP management software or Telnet.*

*For more information on using and configuring these advanced features, please refer to the **NetOutlook** Management Software user manual.*

GX/F MODEL NUMBER REFERENCE CHARTS

***iConverter* GX/F** Dual Fiber Converters			
Port 1 - 1000X (Fiber Type / Distance / Wavelength)	**Port 2 - 100FX (Fiber Type / Distance / Wavelength)**	**Connector Types (P1/P2)**	
		SC/SC	**LC/LC**
MM / 220m / 550m [1] / 850nm	MM / 5km / 1310nm	8562-00	-
MM / 220m / 550m [1] / 850nm	SM / 30km / 1310nm	8562-01	-
MM / 220m / 550m [1] / 850nm	SM / 60km / 1310nm	8562-02	-
MM / 220m / 550m [1] / 850nm	SM / 120km / 1550nm	8562-03	-
SM / 12km / 1310nm	MM / 5km / 1310nm	8563-10	-
SM / 12km / 1310nm	SM / 30km / 1310nm	8563-11	8567-11
SM / 12km / 1310nm	SM / 60km / 1310nm	8563-12	8567-12
SM / 12km / 1310nm	SM / 120km / 1550nm	8563-13	8567-13

For wide temperature (-40 to 60º C), add a "W" to the end of the model number. Consult factory for extended temperature (-40 to +75º C) models. When using single-fiber (SF) media converter models, the Tx wavelength on one end has to match the Rx wavelength on the other.
[1] 62.5/125µm, 100/140µm multimode fiber up to 220m. 50/125µm multimode fiber up to 550m. Refer to the fiber cable manufacturer for multimode distance specifications.

Please contact Omnitron for other configurations.

***iConverter* GX/F** Dual/Single-Fiber Converters		
Port 1 - 1000x Dual Fiber (Fiber Type / Distance / Wavelength)	**Port 2 - 100Fx Single Fiber (Fiber Type / Distance / Wavelength)**	**Connector Type (P1/P2)**
		SC/SC
MM / 220m / 550m [1] / 850nm	SM / 20km / Tx 1310nm, Rx 1550nm	8562-05
MM / 220m / 550m [1] / 850nm	SM / 40km / Tx 1310nm, Rx 1550nm	8562-06
MM / 220m / 550m [1] / 850nm	SM / 20km / Tx 1550nm, Rx 1310nm	8562-07
MM / 220m / 550m [1] / 850nm	SM / 40km / Tx 1550nm, Rx 1310nm	8562-08
SM / 12km / 1310nm	SM / 20km / Tx 1310nm, Rx 1550nm	8563-15
SM / 12km / 1310nm	SM / 40km / Tx 1310nm, Rx 1550nm	8563-16
SM / 12km / 1310nm	SM / 20km / Tx 1550nm, Rx 1310nm	8563-17
SM / 12km / 1310nm	SM / 40km / Tx 1310nm, Rx 1550nm	8563-18

For wide temperature (-40 to 60º C), add a "W" to the end of the model number. Consult factory for extended temperature (-40 to +75º C) models. When using single-fiber (SF) media converter models, the Tx wavelength on one end has to match the Rx wavelength on the other.
[1] 62.5/125µm, 100/140µm multimode fiber up to 220m. 50/125µm multimode fiber up to 550m. Refer to the fiber cable manufacturer for multimode distance specifications.

Please contact Omnitron for other configurations.

PORT STRUCTURE

Using a 4-port switch design, the GX/F features a front-plane 1000Mbps Gigabit fiber port (P1), a 100Mbps Fast Ethernet fiber port (P2) and two 10/100 Ethernet backplane copper ports ("A" and "B") that can connect to adjacent modules within the same chassis.

When the GX/F "A" and "B" Ethernet backplane ports are enabled (using the "BPAEN" and "BPBEN" DIP-Switches), they connect via the chassis backplane to the slots on the left and right sides of the GX/F module. When another switch-based module with backplane ports such as a second GX/F or an NMM is installed in an adjacent slot, it can be connected via the backplane to the GX/F to form a multi-module configuration.

GX/F Application Example

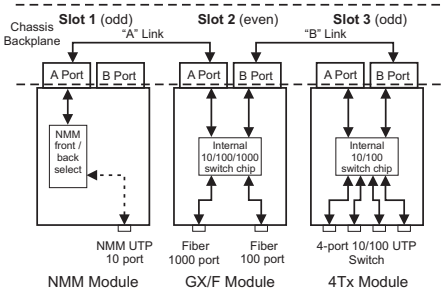

Fig. 1 In-Band Managed GX/F Application

Fig. 1 depicts a chassis with three modules plugged into three of its adjacent backplane slots (beginning with an odd numbered slot). The adjacent slots are connected via the backplane using the "A" and "B" 10/100 links. In this example, the GX/F in the center slot connects to the slot on its left using the "A" link and to the slot on its right using the "B" link.

The module on the left is a Network Management Module (NMM) connecting via its "A" backplane port to the GX/F, facilitating "In-Band" management (via the fiber uplink). The module on the right is a 4-port 10/100 switch module (4Tx) connecting to the GX/F via its "B" port. This 3-module configuration forms an effective managed 4-port 10/100 Ethernet switch with one Gigabit fiber uplink port and one Fast Ethernet fiber port.

This example shows how the GX/F can be used as a managed or unmanaged media converter or as a building block in creating flexible and effective network switch configurations.

For more information about individual chassis "A" and "B" backplane links, refer to the specific chassis' user manual.

LINK MODES

In order to accommodate different user needs, the GX/F supports five different linking modes (see Fig. 2).

In "Link Segment" (LS) mode ("Normal" mode), a port transmits a Link signal independently of any received Link at any port. For example, P2 transmits a Link regardless of the receiving of a Link at P1 [Fig. 2(a) & 2(b)].

In "Link Propagate" (LP) mode (sometimes referred to as "Link-Loss-Carry-Forward"), a port transmits a Link signal only when receiving a Link on the other

front-plane port, and a loss of a received Link at one port causes the other front-plane port to drop its link out. For example, P2 transmits a Link only when receiving a Link at P1 [Fig. 2(c)].

In Remote Fault Detection + Link Segment (RFD+LS), the fiber port transmits a Link signal only when receiving a Link at the fiber port. As a result, fiber faults (no Link received at the fiber) are looped-back and can be reported to the network core [Fig. 2(d)].

In "Remote Fault Detection + Link Propagate" (RFD+LP) mode, the P1 port transmits a Link signal only when both it and P2 are receiving Link signals. A loss of a received Link signal at P1 is Looped-back to P1 and propagated to P2, causing both to stop transmitting the Link signal [Fig. 2(e)]. Also, the loss of a received Link at P2 is propagated to both P1 and P2, which stop transmitting the Link signal.

NOTE: Connecting two converters both set to RFD is not supported and will cause a "deadly embrace" lockup (refer to the Port 1 1000FX Auto-Negotiation DIP-Switch section).

"Symmetrical Fault Detection" (SFD) mode operates similarly to the Remote Fault Detection (RFD) mode. In SFD mode, the loss of a received Link at P1 is Looped-Back to P1 and propagated to P2, causing both to stop transmitting the Link signal [Fig. 2(f)] and also causing blinking in a connected GX/F P1 "Link" LED indicator.

Connecting two converters which are both set to SFD is permitted and facilitates a dual-loop-back feature where P1 fiber faults can be reported to both ends of the network.

NOTE: Converters in SFD mode must be deployed in pairs, and the "LS" DIP-Switch position must also be selected.

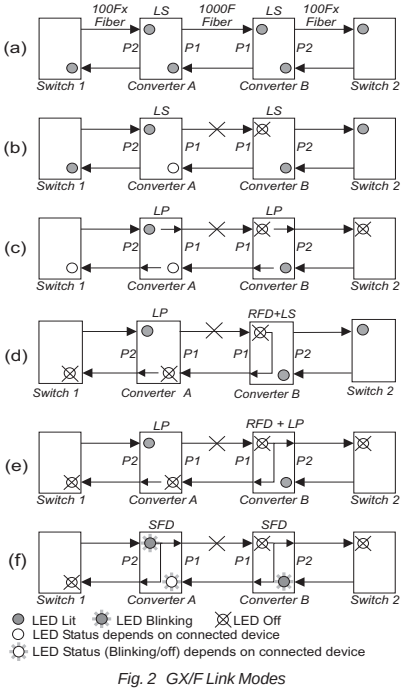

Fig. 2 GX/F Link Modes

DIP-SWITCH SETTINGS

Front Panel DIP-Switch Settings

Fig. 3 Front Panel DIP-Switches

Link Segment/Link Propagate "LS/LP" DIP-Switch

This DIP-Switch controls the Link Propagate or Link Segment modes. When the DIP-Switch is in the "LS" position (factory setting), Link Segment mode is enabled. In the "LP" position, Link Propagate mode is enabled.

Remote Fault Detection "RFD" DIP-Switch

To enable Remote Fault Detection mode, set the "RFD" DIP-Switch to the "RFD" position.

To enable RFD + LS mode, also set the LS/LP DIP-Switch to the "LS" position. To enable RFD + LP mode, set the LS/LP DIP-Switch to the "LP" position.

The RFD DIP-Switch selection is ignored on ports set to Auto-Negotiation mode.

NOTE: Connecting two converters with both set to RFD mode is not supported and will cause a "deadly embrace" lockup.

Symmetrical Fault Detection "SFD" DIP-Switch

To enable Symmetrical Fault Detection mode, set the "SFD" DIP-Switch to the "SFD" position, the "LS/LP" DIP-Switch to the "LS" position and the "RFD" DIP-Switch to the "Off" position.

Any other DIP-Switch configuration will disable Symmetrical Fault Detection mode.

NOTE: Converters in SFD mode must be deployed in pairs.

Board-Mounted DIP-Switches

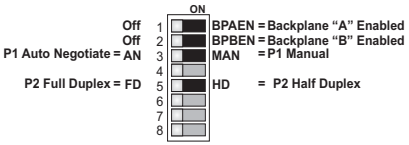

Fig. 4 Board Mounted DIP-Switches

Backplane A Enable "BPAEN" DIP-Switch

When the "BPAEN" DIP-Switch is in the "ON" (right) position, the A Ethernet backplane port is enabled. This port allows connectivity to an adjacent module. When the "BPAEN" DIP-Switch is in the "Off" position (left, factory setting), the A port is isolated from the backplane.

Backplane B Enable "BPBEN" DIP-Switch

When the Backplane B Enable "BPBEN" DIP-Switch is in the "ON" (right) position, the B Ethernet backplane port is enabled. This port allows connectivity to an adjacent module. When the "BPBEN" DIP-Switch is in the "Off" position (left, factory setting), the B port is isolated from the backplane.

Port 1 1000FX Auto-Negotiation "P1 AN / MAN" DIP-Switch

When set to the Auto-Negotiate "AN" (factory setting), this DIP-Switch enables the Gigabit Fiber Port to sense its duplex mode automatically. If the connected device cannot provide the proper signal to indicate its own mode of operation, the P1 Manual "MAN" DIP-Switch position should be selected to force Full-Duplex mode

on Port 1. This facilitates the connection to devices that do not auto-negotiate properly on their Gigabit fiber port.

Note: In order for Gigabit fiber ports to link up, the linking two devices (ports) must be set to the same mode (either Manual or Auto-Negotiate).

When the P1 1000FX Fiber is set to Auto-Negotiation Mode, the device receiving the fault acts as if it is in RFD mode.

NOTE: In older versions of firmware, RFD was not defined on ports set to Auto-Negotiation.

Port 2 100Fx Full/Half Duplex "P2 FD / HD" DIP-Switch

The P2 Full/Half-Duplex DIP-Switch selects the duplex mode for the 100Mbps (FX) P2 port. When set to Full-Duplex "FD" (left, factory setting), the P2 port operates in Full-Duplex mode. When set to Half-Duplex "HD" position (right), P2 operates in Half-Duplex mode.

NOTE: Port 2 100FX is not defined for Auto-Negotiate mode per the IEEE802.3 and is always in Manual mode.

UNUSED DIP-SWITCHES

The following DIP-Switches are present on the GX/F but are unused and do not affect any functionality:

4) P2 AN/MAN

6) P2 100/10

7) P2 1000/10-100

8) P2 AX/MANX

LED INDICATORS

LED	COLOR	DESCRIPTION
Pwr:	Yellow	On--Power
F/O P1 FDX:	Green	On--Full-Duplex detected
F/O P1 Lk/Act:	Green	On--Link / Blink--activity
F/O P2 Lk/Act:	Green	On--Link / Blink--activity
F/O P2 FDX:	Green	On--Full-Duplex detected

MOUNTING AND CABLE ATTACHMENT

The ***iConverter*** GX/F modules are hot-swappable and can be installed into any ***iConverter*** chassis. To install in a chassis, perform the following steps:

1. Slide the ***iConverter*** module into the selected slot while aligning it with the installation guides. Ensure that the module is firmly seated against the backplane.
2. Secure the module to the chassis using the panel fastener screw (attached to the module).
3. Connect an appropriate multimode or single-mode fiber cable to the Gigabit P1 fiber port.
4. Connect the cable to a compatible Gigabit device.
5. Connect an appropriate multimode or single-mode fiber cable to the 100BASE-FX P2 fiber port.
6. Connect the cable to a compatible 100BASE-FX device.

NOTES: Each transmit (Tx) port must connect to the receive port of the attached device; the receive (Rx) port must connect to the transmit port.

When using single-fiber (SF) models, the Tx wavelength on one end must match the Rx wavelength on the other and the converters must be used in matched pairs (example: model 8562-05 must be matched with model 8562-07).

GX/F SPECIFICATIONS

Model Type	GX/F
Protocols	1000BASE-SX/LX, 100BASE-FX
Fiber Connectors	SC, LC Single-Fiber SC
Controls	BP Enable, LS/LP, RFD, F/O Auto/Man, F/O FDX/HDX
LED Displays	Power, F/O link, FDX/HDX
Dimensions	W:0.85" x D:4.5" x H:2.8"
Weight	8 oz.
Compliance	UL, CE, FCC Class A
Power Requirement	1.5A @ 3.3VDC (typical)
Temperature	Standard: 0 to 50º C Wide: -40 to 60º C Storage: -40 to 80º C
Humidity	5 to 95% (non-condensing)
Altitude	-100m to 4000m
MTBF (hrs)	730,000

Warning

The operating description in this Instruction Manual is for use by qualified personnel only. To avoid electrical shock, do not perform any servicing of this unit other than that contained in the operating instructions, unless you are qualified and certified to do so by Omnitron Systems Technology, Inc.

Warranty

This product is warranted to the original purchaser against defects in material and workmanship for a period of TWO YEARS from the date of shipment. A LIFETIME warranty may be obtained by the original purchaser by REGISTERING this product with Omnitron within 90 days from the date of shipment. TO REGISTER, COMPLETE AND MAIL OR FAX THE ENCLOSED REGISTRATION FORM. You may also register your product on the Internet at www.omnitron-systems.com. During the warranty period, Omnitron will, at its option, repair or replace a product which is proven to be defective.

For warranty service, the product must be sent to an Omnitron designated facility, at Buyer's expense. Omnitron will pay the shipping charge to return the product to Buyer's designated US address using Omnitron's standard shipping method.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate use and/or maintenance of the equipment by Buyer, Buyer-supplied equipment, Buyer-supplied interfacing, unauthorized modifications or tampering with equipment (including removal of equipment cover by personnel not specifically authorized and certified by Omnitron), or misuse, or operating outside the environmental specification of the product (including but not limited to voltage, ambient temperature, radiation, unusual dust, etc.), or improper site preparation or maintenance.

No other warranty is expressed or implied. Omnitron specifically disclaims the implied warranties of merchantability and fitness for any particular purpose.

Exclusive Remedies

The remedies provided herein are the Buyer's sole and exclusive remedies. Omnitron shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

TECHNICAL SUPPORT

For help with this product, contact our Technical Support:

Phone: (949) 250-6510
Fax: (949) 250-6514
Address: Omnitron Systems Technology, Inc.
140 Technology Dr.
Irvine, CA 92618 USA
E-mail: support@omnitron-systems.com
URL: www.omnitron-systems.com

Form: 040-08560-001D 12/12